The Builder.

SATURDAY, MARCH 24, 1855.

THERE are few places in London which produce more useful results than the Reading-room at the British Museum. In this place is stored and arranged an immense amount of varied and useful knowledge, open to all without difficulty. It is true that a stranger calling at the reading-room would for a time be puzzled to know where to lay his hands on the matters he wanted, but "Rome was not built in a day," and no valuable knowledge, in connection with either literature, art, or science, can be acquired without a certain amount of exertion. Properly and fairly to understand a book we must fairly and patiently run over the lines, and by some consideration and study gather up the sense.

Fresh works are in progress to increase the efficiency of the Reading-room. The question of additional space for the collection is one which has occupied the trustees from a period even before the completion of the present building, as planned by Sir Robert Smirke, up to the present time. Our attention just now will be confined to that part of the question which refers to the library of printed books. When the present building approached an end, it was found that that portion which was allotted to the department of printed books would not contain more than about 20,000 volumes above the number then in the library, whilst books were pouring in at the rate of a larger number than that *per annum*. It became necessary, therefore, at once to provide for future accumulations. This was done by the erection of an additional room at the north-west end of the building. The space thus afforded gave relief for a few years, but it soon became apparent, from the rapid increase of the collection, that further accommodation must be provided, and it was determined by the trustees to build a room on the east side of the Royal library. This erection filled up all the available space for the library, and Mr. Panizzi began very soon to call out for more room. He suggested that a new library and reading-room should be erected on ground to be purchased in Russell-square.* This scheme was viewed favourably by the trustees, and also by the Commissioners, but the expenses involved in it were so great, that it was necessarily abandoned.

Several reports upon the subject of want of room, and also upon the insufficient accommodation afforded to readers in consequence of the contracted space of the present reading-rooms, were afterwards addressed by Mr. Panizzi to the trustees; and under the date of the 5th of May, 1852, we find one in which, after adverting again to the serious evils which must result from the accumulation of books without proper shelf-room being provided for them, he proceeded to show that any comprehensive system of relief for the whole establishment must involve delays fatal to the library. He then submitted to the trustees a plan, by which he thought that the inconveniences then felt, so far as the library of printed books and the reading-rooms were concerned, could be completely remedied, as well as all eventual difficulties removed in a short time, and at a comparatively small cost, by the erection of a suitable building in the inner quadrangle. This proposal was accompanied by a ground-plan, explanatory of Mr. Panizzi's views upon the subject.

* See Minutes of Evidence, taken before the Commissioners, to inquire into the constitution and management of the British Museum, Q. 4264, 4276, &c.

The plan which offered the greatest facilities was one for building in the quadrangle of the museum a reading-room, with additional libraries round it, clear space being reserved all round for giving light and air to the existing buildings. This plan had the advantage of involving the purchase of no new ground; and, being absolutely out of sight, it spared the necessity of any expense in exterior architecture.

This arrangement was finally adopted. Mr. S. Smirke was authorised to obtain tenders, and last year a contract was entered into for the execution of the whole work by Messrs. Baker and Fielder, for about 100,000*l*.

The new reading-room is a circular apartment, 140 feet diameter, and 106 feet high, lighted by twenty windows, at the springing of the dome, and by a glazed aperture in the crown of it, 40 feet in diameter. The superintendent will sit on a raised platform in the centre, and he is surrounded by two concentric ranges of table cases, for catalogues, &c. The tables for readers radiate from these as a centre, a small segment of the circle being partitioned off to give free access for the attendants going to and from the library, and for the temporary deposit of books *in transitu*. Allowing upwards of 4 feet for each reader, there will be room for 336 readers. The cubic content of air within this room is about 1¼ million of cubic feet, and this ample volume of air will be constantly and gradually renewed by a provision for summer and winter ventilation.

Between the entrance-hall and the reading-room, are the cloak-rooms and other offices; the whole of the remainder of the new building being appropriated to the reception of upwards of a million volumes of books. The book-cases are of wrought-iron, and in the construction of the libraries and of the central dome, bricks and iron are exclusively used. The dome will be covered with copper. The galleries in the reading-room will be of slate, those throughout the rest of the new building, of perforated cast-iron. The decorations will be painted. It is proposed to introduce a series of statues around the room, at the springing of the dome.

The new reading-room will be the largest, and may be made the handsomest in the world. Its position in the quadrangle allows immediate access from the hall, through which readers will proceed to the reading-room, from the king's library, and from the library in the north wing of the building. It is calculated that this structure will be completed and fit for the reception of books and readers in less than two years from the present time. The plan we publish in our present number (p. 138), will give a clear idea of the arrangement, and the view shows the appearance it will take.

To return for an instant to the rooms as they now are, we feel sure that we shall have the concurrence of the majority of those who use the reading-room when we offer testimony to the painstaking endeavours of all the attendants to meet the wants of the readers. Without joining in the common cry against the arrangements, we would yet point out one evil allowed to exist, and that is the length of time during which books of reference are occasionally absent on the score of "binding." The annoyance occasioned at times is very great.

It is much to be desired that arrangements should be made to open some portion of the library at night—say till ten o'clock, to meet the wants of those who have no time at their disposal till the regular pursuits of the day are finished.

It would be a great convenience, too, if the library and print-room were brought more immediately together, and the necessity of obtaining separate admissions to these departments abrogated. The print-room, notwithstanding many important gaps which require filling, is undoubtedly a very fine collection, most interesting both to the scholar and artist; and yet from its isolated position or some other cause, the place is but little frequented. The collection of Flemish prints here brought together is perhaps unrivalled. The Italian and German schools are fairly represented; and the engravings after the works of Reynolds, Lawrence, Turner, and other of our eminent English artists, offer a field of interesting study. The late Sir Robert Peel warmly supported an idea, suggested, we believe, by Mr. Carpenter, the curator of the print-room, to form a gallery of engravings, which would be open to the public in the same manner and at the same time as the other parts of the Museum; and we believe that the long gallery which now contains the Nineveh marbles was originally intended for this purpose, the advantages of which it would be difficult to estimate.

If this gallery were formed, the public would have the opportunity of viewing the rare etchings of Rembrandt, engravings of the works of Raffaelle, Michelangelo, and other magnates in art. The prints might be changed at intervals, and a constant and varied interest kept up.

To the student in architecture or art, the print-room is much injured in utility by the strict regulation against either tracing or measuring the engravings. No doubt the scarce and valuable proofs should be treated with care, but not so much as to render them, to a certain extent, a dead letter; for of what use is the architectural collection if the architect who goes there for information is neither allowed to trace nor measure the proportions? Some plan should be hit upon, to facilitate the means of obtaining correct copies, either by squared glasses, or by some other process.

ON THE MOSAICS AND OTHER DECORATIONS OF THE CHURCH OF STA. SOPHIA, CONSTANTINOPLE.

THE following is the substance of Mr. Digby Wyatt's address referred to in our last:—

The decoration of Sta. Sophia is of two principal kinds: one consists of a certain number of points, more or less structural, to which I shall first call your attention; and the other of a system of mosaic ornamentation of the highest importance in relation to the history of that art,—so important, indeed, that I propose to bring under your notice first, the mosaics of Sta. Sophia as they exist; secondly, their historical position as compared with other mosaics; and, thirdly, their peculiar technicalities of production: so that our review may embrace not only the artistical nature of these magnificent monuments of early Christian art, but their historical position, and the actual mechanical operations by which they were executed.

The principal technical point in relation to the general working of the sculptured ornament of Sta. Sophia to which I would call your attention is displayed, almost universally, in the capitals and other carved features which stamp Byzantine architecture with its leading peculiarities of style. In classical architecture, the principle of superadding foliage to construction was generally followed, and in obedience to this law both ancient Greeks and Romans usually adopted a bell or a moulding line as a basis, and then planted on such a fundamental form whatever decoration of leafage they desired to use. The Byzantine architects departed from that system by first cutting their stonework into the general shape required, and then sinking or draughting into it all their different enrichments; and from this it follows as a corollary, that Classic ornament was completed before the erection of the block of stone or marble decorated, and that Byzantine was executed subsequently to the fitting in place of the main structural forms. This is the general principle which distinguishes Byzantine from Latin work; and wherever we recognise its adoption in the architecture of India, Russia, Lombardy, or the North, we may be sure that the influence of the Byzantine school was paramount; as was especially the case at Pisa and in Sicily. As Byzan-

tine architecture reached its earliest, as well as its highest, development in Sta. Sophia, it becomes exceedingly interesting to recognise the unquestionable assertion of this principle by its architects and artificers.

The second point with regard to ornamental decoration to which I shall allude is very important, since it materially affects the history of both plain and coloured glass. The windows of Sta. Sophia are formed of a series of slabs of marble, pierced in apertures of about 8 inches by 10 inches. In these sash-bars, as I may call them, there is a rebate left on the outside in all cases, and it appears to me most probable that these apertures were filled in with coloured glass. The reason I have for thinking so is, that we know that the Byzantines were perfectly well acquainted with all the processes of glass-making. Their enamels were proverbially beautiful, and Buonarotti has given us many interesting details concerning their glass vessels, which they painted with fluxes, and decorated by other processes at a very early period. Of many varieties of such vessels there are specimens existing in the Museum Christianum of the Vatican at Rome. These actual remains prove to us that they were masters of the technicalities of glass-work. Paulus Silentiarius alludes to the beautiful effect of light and colour in this building of Sta. Sophia, when seen in the early morning; and Paul the Hermit, and Fortunatus of Poictiers, in his "Carmina," also describe this effect. Theophilus, who was a writer on the technical arts a little before our Conquest, has a whole treatise upon the subject of stained glass, which he prefaces by stating that he had taken the pains to go to Sta. Sophia to examine the effect of the light, coloured by transmission, in order to qualify himself for writing this section of his book. When it is remembered that Sta. Sophia was commenced in the year 532, and completed about 540, it is interesting to have grounds for the belief that stained glass was extensively used at such an early period.

Until recently, the assertion of the Benedictines, that coloured glass was not known previously to the time of Charlemagne, has been generally regarded as correct. French and English antiquaries have, however, found allusions to its existence at a much earlier period; as early, indeed, as the year 600, and the details now given to the world concerning Sta. Sophia afford a strong corroboration of their views.

These windows, in their general form, present a certain number of square compartments, by filling in some of which, and omitting others, a Greek cross would be produced in the centre opening, and crosses, similar to those carved beneath the window, in the side openings, supposing such an ornament was wanted. Although frequently alluded to by ancient writers, few remains exist agreeing with what they called the "simplex fenestra;" but it appears that in the early days of the history of coloured glass, that was the most common form; and I have little doubt that the windows of Sta. Sophia presented the primitive type of such windows as those which Benedict and Biscop, according to Bede, introduced into this country in the seventh century.

Another circumstance which corroborates my view that there was stained glass in Sta. Sophia, is that the Eastern nations generally, whose architecture was originally based on that of Byzantium, have windows cut or pierced out of stone, and occasionally made up with plaster, on the weather side of which they fix pieces of coloured glass of singular shape and pattern. Occasionally these windows are introduced in domes, and in such cases, the stone or plaster inside forms the lines of the dome, and light enters through the little pieces of stained glass which cover the apertures, which are formed into simple geometrical patterns, as they would be in this pierced part of the dome of Sta. Sophia.

These are the most important special points to be noticed, so far as the building of Sta. Sophia itself is concerned; but since its peculiarities of style and the novelties of form introduced in its construction can be properly appreciated only by contrast with the monuments which preceded it, we shall glance for a few moments at them.

One of the plates in Salzenberg's work, to which Mr. Nelson did not particularly allude, gives illustrations, showing the extent to which the Latin or Basilican arrangement was carried in the church of Agios Johannes, built by Leo the Great, in 463, only seventy years before Justinian commenced the building of Sta. Sophia. We find in that church a perfect basilican arrangement, exactly similar to that of Sta. Agnese at Rome, with narthex, apse, choros, second story, forming galleries for females, &c. complete. A hasty comparison of the plan of this church with that of Sta. Sophia shows how the Latin mode of arrangement differed from the Byzantine, while a close investigation of the subject generally, will demonstrate that, as the styles were retained clearly and distinctly in architecture, they were no less so in portraiture and ideal painting.

Proceeding now to the mosaics of Sta. Sophia itself, I will begin by describing the visitor's impressions on entering and making the circuit of the building. He first passes through a small and rather unimportant pro-narthex, or portico, which conducts him into the long gallery, which is the real narthex. As it is in this gallery that we first meet with any indication of Byzantine individuality of faith and character, I may be allowed perhaps to dwell briefly upon qualities which lie at the very root of the outward and visible forms in which much religious fervour was for ages embodied, not only by means of mosaic, but by calligraphy, sculpture in stone, metal, and ivory, embroidery, and every process by which the voice of art has ever hitherto appealed to the heart and conscience of man. Now, the great distinction between the Byzantine and Latin modes of working out religious conceptions (that is, between the Eastern and the Western modes) is, that, in the Western or Latin mode, symbolism was universal. The art of the Catacombs was followed distinctly, though frequently remotely, developing itself in mythical and sentimental forms, and systems of parallelism between type and prototype. In the Greek Church, the exposition of faith through art took a more tangible form. Symbolism was avoided on all possible occasions; and direct representation led to a partial transfer to the representation of the adoration due to the thing represented. In the advanced periods of Greek art, this realistic tendency led to a painful view of the nature of religion, more particularly in connection with the martyrdom of saints, and the physical sufferings of our Saviour and his followers, which were represented in the most positive and often repellent forms.

I stop at this point to point out that over the entrance-door is to be found the only piece of symbolism throughout the building. Over that door is a small panel cut in stone, intersecting the mouldings of the architrave, and containing a representation of a sort of enclosure or "cancellum," with a seat of honour, and upon it an open book with the Holy Ghost in the figure of a dove descending upon it; being, in fact, the Spirit of Holy Wisdom (to which Justinian dedicated his Church) embodied. The inscription on the book is, "I am the door for the sheep: let him who is fitted enter, and he may walk in and out, and there shall he find pasture."

Numerous doors from the narthex lead into the main building. The whole of the sides of the walls were lined with precious marbles to a certain height, and above that commenced the mosaic work. This is, like all Byzantine glass mosaic work, on *a gold ground;* but it also has the peculiarity (unique, so far as I, or anybody I know, is aware of), that it has, in its patterns, in addition to gold mosaics, *silver mosaics.*

There is a very valuable MS. known as the Lucca MS. supposed to be of the seventh or eighth century, and printed by Muratori, in his great "Annali d'Italia," in which the writer gives an account of the process of making golden and silver mosaics. Both in the "Schedula diversarum Artium," of Theophilus, and in another MS. of rather later date, about the year 1200, known as the "Mappæ clavicula," or key to drawing), published by Sir Thomas Phillips in the Archæologia, and supposed to be an English work, there is an almost identical description of the art of making mosaics, but omitting any special allusion to silver work. In writing a book on the subject some time ago I mentioned this process, though I was not then aware of the existence of any actual specimen of it; and I am therefore very glad to recognise it in Sta. Sophia, since it proves that the old writer of the Lucca MS. described things which really existed, and not myths or traditions only.

We here meet with a very interesting and entirely new element of design, which is totally different from any of the Roman ornament. A comparison of these with analogous Latin remains will show that the latter are almost entirely imitations of antique work; but here, coupled with these silver mosaics, we find a distinctly Oriental character of decoration. It is again repeated in other mosaics—particularly in this form of leaf, which is quite Oriental in character.

Now, it is a curious fact, that the year in which Sta. Sophia was commenced was the very year in which Justinian concluded an eternal peace with Chosroes Nushirvan, king of Persia. We know that in one or two reigns antecedent to his, Greek artists had been employed in Persia, and that there had been a friendly communication between the two countries. We may therefore assume, that when Justinian proposed to build this structure in so short a time, he not only enlisted the ability of those about him, but that he attracted back those erring spirits who had gone to seek their fortunes in other countries. He probably, indeed, employed not only his own subjects, but foreigners—and in that way we may believe that a considerable portion of what no one can fail to recognise as Oriental art was mixed with Byzantine.

The principal portion of the mosaic work in the narthex is over the centre door, which was known as the King's door; and there we find a very beautiful mosaic, which represents the figure of Our Saviour in the act of benediction.

There is a peculiarity about the mode of benediction which it may be interesting to point out. The Latin benediction was given with the thumb and two fingers extended, representing the Trinity. Here, however, the first finger is presented straight—representing the J in "Jesus"—the second is crooked, to form the Greek capital S in the same word—the third finger is crossed to it, but still bent, to make the Ch for "Christus"—and the fourth is bent to make the S the last letter, and in that ingenious way the benediction appears to have been given, as here represented.

The book held by Our Saviour in this mosaic bears the words in Greek, "Peace to you. I am the light of the world;" confirming the view that it is actually the representation of Our Saviour. In medallions, on one side is the Virgin Mary, and on the other the Archangel Michael holding the abacus, which was a symbol of chiefdom. There is another figure, prostrated in the Eastern manner introduced by Diocletian. There has been a question as to whom this figure represents. Salzenberg supposes it to be Justinian himself. Fossati says it is Constantine Pogonatus. I think the mosaic is certainly of Justinian's time, and that it is a *capo d'opera*—the best piece of all the mosaics, and one upon which the artist would take most pains, and that it therefore probably represents the great emperor himself. It appears to be in good preservation. Unfortunately Sta. Sophia has suffered very much indeed, and the highest class of representations is that which has been most injured; because, as the Mussulman could not bear the representations of the Giaour, they covered them up as far as possible, and damaged them wherever they could.

Passing through the King's door, and turning to the right or left, we enter the side halls, which are groined over with flattened heads to the groins, just as in the narthex; and the mosaics are of a similar character. They exhibit the same principle of marking all the arch lines and the lines of the vaults, and indicating the round basin-shaped termination by a circular ornament in the centre.

It is remarkable that in these mosaics there is no religious symbol but the cross; a circumstance which does not occur in any building of the period in the Latin Church.

Leaving the under part of these galleries, appropriated to the men, for the upper part (or

gynæceum) appropriated to the women, we find the richest kind of mosaics, placed there no doubt because they were conspicuous from the nave below through the openings between the pillars of the upper arcade. From the central point of view under the great cupola, these domes and groins would appear to great advantage and have a very beautiful effect. Here appear to have been a certain number of domical parts rising to a higher basin shape than the lower vaults. There are only two of the decorations existing, and of them only some small fragments are perfect; but there is enough to make out that the central subject was our Saviour, and round him the twelve apostles, with the fire descending from heaven upon their heads; a representation of "The Day of Pentecost." The figures in the pendentives are spectators looking up in wonder at the miracle.

These patterns are the triumph of the whole series of illustrations of surface decoration. They are singularly beautiful, and in them we find the taste of the master architects themselves displayed, who no doubt gave the predominant lines; and we see, as might be expected from Anthemius of Tralles and Isodorus of Miletus, a remarkable retention of Greek forms, while in others an Oriental character is introduced apparently by the workman or "pattern-drawer," an occupation which has ever remained distinct in the East from that of the architect or builder.

The central nave has a great semi-conch at each end, with subsidiary conchæ opening into them. From the springing level of the greater conchæ the pendentives start, and over them rises the main dome. It appears that the decoration of both conchæ and of the great hollow of the roof was plain gold ground mosaic. The main western and eastern arches were ornamented, but both of them were executed at a period subsequent to that of Justinian, or at any rate some accident may have happened to them, and what now appears is of a later era.

The principal mosaics of this part of the central nave are between the windows. Underneath the windows are a series of Greek saints in arched recesses, St. Gregory, St. Nicholas, St. Basil, St. Anthemius, and others. The figures are very dignified; they wear the pallia so conspicuous in the bishop's dress of the Greek church. Above them stand the twelve minor prophets, and at the ends are two larger figures on each side, representing the four greater-prophets. Above are some slight remains of four figures, supposed to be the four evangelists.

In the pendentives there are enormous seraphim. These figures are of immense scale, and fitly carry up the eye to this "empyrean"—(the dome itself). The effect produced in this dome by the cross lights admitted through the coloured windows at its base, must have been that of an air of mist and rainbow-tinted vapour, so that any great picture at the summit would appear to be floating in it, especially if the glass contained a predominance of blue. The ancient writers describe a great figure of the Almighty in this place. So that, in looking at this series of mosaics, we ascend the gradations of the saints, the prophets, and the evangelists to the abode of Deity itself—a very beautiful conception, and very beautifully worked out.

As we enter the bema or sanctuary, we find that here, over the high altar, stood guardian angels. The whole arrangement of the east end is very simple: there is no dramatic story told, but the treatment is noble and impressive.

Architecturally speaking, there is great ability displayed in the introduction of lines of colour on the ribs of the great dome, to give the gold which occupies the spaces between the ribs tint and substance. The rib patterns are shown on the drawing. The detail looks coarse, but as it was very distant from the eye, the forms and colours required to be strongly contrasted.

This is a section through the windows at the base of the dome. As the light played on their illuminated jambs or sides, and flowed across this coloured work, the effect must have been quite exquisite.

The two main arches having to do the principal work in the support of the dome have suffered most, and have consequently needed reparation. This western one was repaired in the time of Basil the Macedonian, late in the ninth century. The other or eastern one was restored in the time of Johannes Palœologus (about the year 1345). The first of these has in the centre a representation of the Virgin Mary, with St. Peter and St. Paul on each side, and two other figures which are not very clear. On the other is a representation of a sort of throne, which is very much defaced, and figures of the Virgin Mary, St. John the Baptist, and Johannes Palœologus himself, who repaired the arch. The presence of the Virgin, as she is represented in the picture, would at once indicate a later date than that of Justinian, even if we did not know the exact period of its execution.*

AN ARCHITECTURAL SCAMPER IN FLANDERS AND BRABANT.†

GHENT AND ANTWERP.

WE will now proceed to furnish a few notes on the far-famed city of Ghent. Architecturally speaking, there is much more of an interesting character to be found in Ghent than in Bruges, whilst its historical associations are of a much higher order. The streets are more modernized, but the antique specimens which remain bear a more costly and magnificent stamp. Stone is very generally the building material employed, and the house-fronts being in many cases profusely carved, a degree of richness is produced, which, in brick, would be utterly impracticable.

Viewed from a distance, the appearance of the city is extremely picturesque. The great number of towers, and the peculiar shape of some of the cupolas and other crowning portions, impart something of an Oriental aspect to the place.

Some of the old buildings still preserve a little of the castellated character. The castle of the counts of Flanders still exhibits its portcullised gateway, and in the Friday's Market a lofty circular tower with conical roof flanks the corner of the square. The Hotel de Ville is a thing of shreds and patches, erected at different periods and in different styles. The more ancient part is a fine example of the dying glories of the Gothic style, when, like the expiring dolphin, its convulsive struggles resulted in a hue of richness which for a time almost atoned for the progress of decay. The general description is something as follows. There are two tiers of windows, the lower having four-centred depressed arches, the upper ones trefoil cuspated: each tier have transoms, and are in two lights each. Between the windows shallow angular buttresses spring from the base, and are corbelled out, and branch into two niches each, surmounted with canopies and tabernacle-work, rising to the summit of the building. The spandrels and wall-spaces are sunk in panels, with tracery of the most elaborate character worked in them. Rich dormers rise from the roof, but they have either never been completed, or have been partially destroyed. This general character of the façade is broken into in several places. In one part a double portal with panelled division occupies two bays: in another, a semi-hexagonal oriel of shallow projection in three lights extends the whole height of the building. At the external angle an octagonal turret is carried up with a projecting balcony carried round midway. The more modern part of the stadt house, is a bald and tame structure in the revived Italian of the seventeenth century, with three orders over each other, and is utterly unworthy of criticism, though the dormers on the roof are rather picturesque.

The beffroi, or belfry tower of the city, is of very ancient date; but the windows having been built up with brick, and all signs of decoration destroyed, it presents nothing specially worthy of notice. An ugly lantern of cast iron, surmounted by a low open spire, is now in process of erection.

Of the churches, the cathedral of St. Bavon claims the pre-eminence. It is a large and noble structure, the exterior bold and effective. The style of the work varies in different parts, commencing with the choir, which is the oldest, probably the latter end of the thirteenth century, and continuing on westward to the latter part of the fourteenth. The western tower, which is of later date, has octagonal turrets carried up in the angles, which are detached in the upper part. The window tracery is geometrical in the choir, and flowing in the nave. The exterior, generally, is rather decayed and dilapidated.

The plan of the building is a Latin cross, with apsidal east end, and multangular chapels round the choir. The piers are shafted. The shafts of the choir piers have foliated capitals. The shafts of the nave piers have no caps at the spring of the pier arches. The shafts which go up to the summit have foliated caps at the spring. There is no triforium in the nave. In its place there is a recess in the wall over the pier arches, along which a passage extends. The choir has a triforium of continuous panelling. The north and south transept windows are large and lofty, but the tracery has disappeared. The screen between the choir and its aisles, is in black and white marble. The screens of the side chapels are in coloured marbles, with columns and pediments, and statuary above. The chapels are rich in pictures. The organ is a fine Renaissance composition. It is placed against the east wall of the south transept over the arch of the aisle. The pulpit is a very beautiful piece of sculpture, having statues in marble of a man awaked from sleep by an angel, with the inscription, "Awake, thou that sleepest, and Christ shall give thee light."

The church of St. Jacques is a very ancient building, in a wretched state of dilapidation externally. The interior has been restored in modern Gothic. The plan is the usual Latin cross, with apsidal east end, and multangular chapels. The transepts do not project beyond the side aisles, which are carried out to the outside of the buttresses, forming recesses internally.

There are two towers at the west-end, and an octagonal tower and slated spire at the intersection. The western towers are Romanesque in character, with semi-circular blank arcades. The southern tower has a low octagonal stone spire, crocketted at the angles, with lower spirets at the corners. This is apparently of twelfth-century date. The North-Western tower has a slated square spire. The pulpit is rich, with a fine marble statue of Moses below. The choir screen is Renaissance, in black and white marble.

The church of St. Nicholas is also much dilapidated, the tracery knocked out of the windows, and hovels built against the exterior. The original style appears to be early thirteenth century, continued down to a later date. The plan is similar to the churches already described, the aisles carried to the outside of the buttresses. The interior possesses the main features of the thirteenth-century architecture, but they have been considerably pared away and modernized in the style of the seventeenth century. The choir has no screen, and is merely surrounded by a simple railing. There are two stained glass windows, recently inserted, of the modern Flemish school,—one by Capronnier, the other by La Roche of Brussels,—which possess considerable merit. A carved marble balustrade behind the high altar is worthy of notice. There is also some new carved woodwork across one bay, between the choir and north aisle, which is very beautifully executed in wainscot, in the Renaissance style. The tower is at the intersection of the cross, with round turrets at the angles. The turrets and towers are covered with slated spires. It has two tiers of coupled windows on each face, with flowing tracery.

St. Michel is a large cross church, with apsidal east end, of late thirteenth-century character. The tracery in the clerestory windows is, for the most part, gone. That in the aisle windows is of flowing design. There is no triforium, its place being occupied by a balustrade, in the Renaissance style. This church, in the upper part especially, has evidently been patched up and restored with small regard to consistency. The pulpit is very fine, carved in mahogany, with white marble bas-reliefs in the panels, and a group of statuary below, of Christ restoring the Blind.

The Church of the Dominicans, in the Rue de la Vallée, is a somewhat remarkable building. It is apparently of early fourteenth century date, a period when boldness of design and

* To be continued. † See p. 98, *ante*.

daring construction began to take the place of the simplicity of the previous century. In plan it is a simple parallelogram, without aisles. The buttresses are of great depth. The windows, which are brought to the outer edge of the buttress, occupy the entire space of each bay, and are faced externally by gables rising above the eaves. The internal recesses thus formed are vaulted with stone. The main roof in one span is a pointed arched barrel vault, with wood ribs, and boarded with oak shingles. The whole strength of the walls has been concentrated in the buttresses, to resist the thrust of the roof ribs, but their strength has been insufficient, the walls having yielded, and the roof is now tied with iron rods. The west front is remarkable for the enormous triple windows which occupied originally nearly the entire breadth and height of the façade. This construction, like the other, appears to have been too daring, the tracery has disappeared, and the apertures are built up with brick.

The modern public buildings in Ghent are not numerous. The university, built in the year 1826, has an octostyle composite portico, with pediment over. The details are said to be copied from the Roman Pantheon. The sculpture is hard and poor, in the worst Roman style, and the whole composition wants life and vigour.

The Palais de Justice, by the same architect (Roelandts), is a much superior building in point of design. It is in plan a rectangular parallelogram, with pedimented central projection on each front. The principal front—which, unfortunately, like too many of our own public buildings, faces the north—has a Corinthian portico, hexastyle pseudodipteral, crowned by a pediment with sculpture in the tympanum and statues at the angles and summit. The portico is elevated on a lofty rustic basement, and is approached by two flights of steps, with balustrades extending laterally on each side from the ends of the projection. The windows of the principal story are faced with Corinthian columns, pediments, and balustrades, supported on corbels, and corresponding with the sub-order underneath the portico. Altogether the arrangement and conception of this façade are exceedingly effective. The lateral staircases were a happy idea, extending the base of the portico, giving apparent strength and dignity to the centre, assisting to carry the eye easily upwards, and imparting an agreeable variety to the design.

The situation of the building is admirable, the river flowing along one side, and an open area round the three others. The interior arrangements, so far as accessible, appear to be good, with evidences of careful study, and some originality of design and construction.

Some of the modern houses in Ghent are worthy of notice for the taste displayed in their designs. We will not further allude to the subject here, as before concluding the paper it is our intention to say a few words on the modern domestic architecture of Flanders.

Let us now proceed to the far-famed city of Antwerp, which is to a much greater extent the resort of tourists than either Ghent or Bruges. Few cities present greater claims to the notice of the artist, the architect, and the antiquary. The birthplace and the residence of Rubens, and the depositary of the most precious relics of this prince of Flemish painters, it is the shrine towards which the steps of many an art-pilgrim are yearly directed. Its marvellous cathedral offers food for thought and practice for the pencil of the architectural student; whilst as a commercial city of the first class during the Middle Ages, and still retaining many of its ancient characteristics, the historical student may glean suggestive illustrations of the highest value.

Some of its street architecture, both ancient and modern, is very fine, particularly that in the Flemish modification of the Cinque-cento style, the influence of which may be traced down to the present time.

The cathedral naturally claims our first architectural notice. In size and proportions it ranks in the very first class, being 500 feet long and 250 feet across the transepts. It has also the great advantage of unity of design and consistency of style, being pure Mediæval, without any admixture of Renaissance. The plan is the usual Latin cross, with apsidal east end. The nave has five aisles in the width, open without obstruction from side to side. The choir has also double side aisles, but the outer aisle is formed into chapels. Many of the windows have lost their tracery heads. That which remains is of flowing character, some of it of beautiful design. The clerestory windows are unusually large. There is no triforium, in the usual sense of the word, its place being supplied by a gallery or passage, faced with a balustrade and panelling continued down to the extrados of the pier arches. The piers are shafted in a very elaborate manner, the shafts carried round the pier arches without capitals. The shafts which run up to the upper vaulting have foliated caps.

The vaulting consists simply of pier ribs and cross springers, with bosses at the intersections. The walls of the side aisles under the windows are worked in narrow sunk panelling with trefoil arched heads. The lantern at the intersection of the cross is wood, of modern construction.

The stalls in the choir are modern, very beautifully carved, but with a certain degree of stiffness and constraint about them: some of the figures are exquisite. From an examination of some repairs going forward, it appears that the interior face of the walls is brick, covered with a thin coat of plaster.

The pulpit, situated on the south side of the nave, is a rich piece of sculpture by Verbruggen, comprising emblematical figures of the four quarters of the globe, foliage, drapery, cherubs, angels, birds of all climes, &c. The organ occupies the west end of the nave, and blocks up a large portion of the great west window. It is Renaissance in style, and very large. The orchestral gallery is supported by columns of coloured marbles, with similar balustrade.

In one of the octagonal side chapels of the choir, we observed a monument somewhat novel in style, but very effective. It consisted of a bas-relief in white marble, placed within a pointed arch, forming a shallow niche, the exterior mouldings carried up square, so as to form spandrels. The mouldings and spandrels were richly ornamented in gold and colours. Within the niche under the bas relief is placed a brass panel, on which is engraved the memorial inscription. The contrast of the white marble with the richness of its enclosing frame, so far from being inharmonious, rather seemed to add to the beauty of each.

The exterior of the minster is so completely hidden by the buildings erected round it, that it is only at the portals and the west end that a glimpse can be obtained. The portals are large and fine, but have been, to some extent, mutilated in the restoration of them. Some polychromic decoration has been introduced, with good effect.

The appearance of the west front, with its twin towers, one truncated, the other shooting up its rich coronal to the height of 403 feet, is well known, and in its particular style—that of early or middle fifteenth century work—is unsurpassed. The plan of its construction is very simple,—a square substructure in four stages, slightly recessed back in each of the upper stories, having square buttresses at the angles finished with a corbelled projecting parapet. A multangular staircase turret is carried up in one of the resilient angles of the buttresses, partially obscuring one bay of the windows. From the level of the parapet rises an octagonal lantern in three stages, crowned with an ogival coronal. The buttresses are carried up as counterforts, encrusted with tabernacle work, and connected with the lantern by flying buttresses. The tracery of the windows is peculiarly light and delicate, and the whole of the surfaces are covered with panelling, tracery, crockets, finials, &c. for which all the resources of mediæval skill and taste have been laid under contribution. In the upper part of the lantern, where there is a profusion of light and delicate shafts standing detached from extraneous support, a system of iron ties and bands has been adopted, which very judiciously *encircles* the parts to be supported, instead of—as is too often the case—letting in the iron rods and ties, and so hastening decay by the very means adopted to prevent it.

The Dominican Church of St. Paul is more celebrated for its "Calvary," with its artificial rockwork and tawdry accessories, than for any special architectural beauty. It deserves, however, a passing notice, for some peculiarities of construction. Its plan is the usual Latin cross; the transepts shallow, and the choir without aisles. The piers are cylindrical. In place of the triforium, galleries are carried over the side aisles. The south transept has an aisle carried across its south end, opening by arches into the transept,—a very unusual arrangement. The choir windows are very long, and extend nearly down to the top of the stalls: they have transoms, and are filled in with flowing tracery of rather late date. The vaulting is somewhat dome-shaped between the pier ribs, a peculiarity not common in Flanders, but very frequent in the centre and south-west of France. The west end, with its portal, has been very effective, though, in style, of late date. It is now much dilapidated. Internally, the walls are lined with good carving in wainscot, having twisted columns in the Renaissance style. A noble organ, with an orchestral gallery, fills up the western end of the nave. An octagonal tower of seventeenth century architecture, crowned with a dome and cupola, is carried up on the east side of the south transept.

St. Jacques is a large and noble cross church, with a tower at the west end. Its principal celebrity is derived from the tomb of Rubens, which is situated in a chapel immediately behind the high altar. Architecturally, the nave and choir have double aisles, the outer range of which are chapels, very rich in marbles, statues, stained glass, and pictures. The transepts have double aisles on the east side; the piers are cylindrical; the vaulting slightly domical; the window tracery of flowing design. The east end is apsidal, with multangular chapels round. The general character of the architecture is early fifteenth century. The tower is apparently of the same date as the western towers of the cathedral, which it much resembles in style, having boldly-projecting buttresses with deep recesses, incrusted with panelling and tabernacle-work. Though now of considerable height, it is incomplete, having evidently been intended to be carried much higher. The western portal is large and lofty. It bears the date of 1694, and is a curious and almost unique specimen of Gothic architecture as understood at that time. As may be supposed, the design and detail are as poor and meagre as could well be imagined. The exterior of the church is almost entirely blocked up with buildings erected against the walls.

The Jesuits' Church, dedicated to St. Charles Borromeo, is a florid Renaissance design, bearing the date of 1621. The western front is now undergoing a thorough restoration. It consists of three stages or orders. With some freedom and originality in the design, it is too much broken up into detached portions, with frittered patches of ornament stuck on. Internally it is fine, being somewhat of a basilica in form. The aisles have two tiers of arcades, with galleries the full width of the aisles. The east end is semicircular. Two chapels at the sides are very rich in marbles. The gates of these chapels are fine specimens of metal-work, and the altar balustrades richly sculptured in marble. The wainscotting of the walls, the confessional, and pulpit, are beautiful specimens of wood-carving. The panels are fitted in with bas-reliefs, illustrating scenes in Scripture history.

The church of St. Andrew owes most of its fame to the celebrated pulpit, by Van Hool and Van Gheel, of the Calling of Andrew and Peter. Architecturally it possesses no features worthy of special remark. It is a cross church, the transepts shallow, the choir short, without aisles, the latter being, however, prolonged two bays to the eastward of the cross. The tracery has disappeared from most of the windows. What remains is of geometrical design. The piers are cylindrical. There is no triforium. The vaulting consists of pier ribs and cross springers, slightly domical.

A new church in the Rue de Malines, dedicated to St. George, is in progress, but the works seem to be at present suspended. The architecture is in a very good style of late Pointed, having a little of the Flamboyant cha-

racter. The depth of the projections and recesses gives great boldness and vigour to the design.

Of the secular buildings, the Bourse is, on many accounts, the most interesting. Erected in the palmy days of mediæval commerce, it furnished Sir Thomas Gresham with the model for his own Royal Exchange of London, which was but a humble copy of its continental original. How different have been the fortunes of the two erections! Whilst the younger edifice has been twice a prey to the flames, and has each time risen from its ashes with expanding vigour and increasing splendour, until it has become the centre of the world's commercial transactions, its prototype has quietly dozed down the march of time a monument of departed greatness. The situation and arrangement of the building are somewhat peculiar, though well adapted for its purpose. It is placed at the intersection of two lines of streets at right angles, which abut upon the centre of each face of the building, so that the only external façades it presents are those closing the ends of the four streets. Within it consists of a quadrangle, with a surrounding cloister, having an upper story. The architecture is debased Gothic, of the date 1531. The front is supported by slender cylindrical columns, having shallow tracery or panelling of various patterns worked on the shafts. The cloister is groined with stone, with tracery of very complicated design. The vaulting, pressing outwards on the slender columns supporting the front, has required the introduction of iron ties, by which the edifice is now bound together, both laterally and transversely.

Within the last twelve months a roof of iron and glass has been thrown over the centre quadrangle.* The execution of this work required more than common boldness and skill. The old building was so ricketty, that no support whatever could be permitted from that quarter, and the introduction of cross ties was deemed objectionable, probably from the lowness of the structure. These difficulties have been overcome in a most skilful and scientific manner by the architect, M. Marcellis, of Liége. The size of the area covered is 140 feet by 100 feet. The roof is formed by four cast-iron ribs at the angles, and two on each of the four sides, springing from strong cast-iron columns, and abutting against the rim of a large oval lantern in the centre. The unequal lateral thrust of the ribs at the sides, compared with those at the angles, is overcome by a very ingenious application of a simple geometrical principle. All the ribs except the hips are projected over to such a distance beyond the supporting column that they are all the same length. The extremities being tied by strong iron bars, form a regular polygonal figure, counteracting the lateral thrust, and supported by the iron columns, entirely independent of the building. The projections alluded to are not visible, being hidden by the roof of the building surrounding the quadrangle.

The Grand Theatre is a large and spacious building of classical design. The entrance front is a composition of considerable merit. The basement is open, with an attached semicircular colonnade on the principal story of the Corinthian order, having niches in the intercolumniations, filled with busts of Mozart, Racine, Molière, and other dramatic writers and composers. On the entablature statues are placed over each column.

WAGES WITH STOPPAGES.

THE truck system has more than once formed a subject of legislative inquiry and enactment, on account of the rascality by which, through its means, the poor working classes have been cheated of the fruits of their labour. If what is represented to us be true, there is another system of stoppage of wages to which the Legislature, and even the Government, would do well to turn their immediate attention. We allude to the frame rent system of the frame-work knitters in the midland districts. Under this system, it is alleged that it frequently occurs that where a master has a certain number of frames in his premises, for which it is the custom to charge a weekly rent, payable by those who work at them for the frame proprietors themselves or while in their employment, the master, instead of employing only so many operatives as may be able to earn a sufficient livelihood, will, if possible, employ as many of these poor people as he has frames for them to work at; and that he makes it his object to give each, in the first place, only as much as will pay himself the rents demanded for being allowed to work at the frames, so that when each may thus earn 3s. 6d. only in the course of a week, as often happens, they actually get nothing for their labour. Nay, that in cases where the frame has been idle for several weeks, the rent for all these weeks is first deducted, so that as lately occurred, one poor workman had to pay 9s. 1d. out of 9s. 2d. or rather was paid one penny out of 9s. 2d. earned by his labour! In another case, brought in vain before the magistrates, a master who "did not like to be hard with" the unfortunate who worked for him, liberally gave him 6d. out of 5s. 11½d. thus earned. There is something so incredible—so abominable in such a system, that for the sake of humanity we do hope it is much exaggerated; but if not, the Government ought to look to it; for it would seem to explain much of the turbulent spirit not seldom manifested amongst the frame-work knitters of the midland district. Here, in solemn earnest, are, in that case, the seeds of revolution. This is the tinder or the explosive train which only awaits the spark, and its action will be sudden and unexpected, and may rouse thousands, and tens of thousands, who may have their own special subjects of discontent, real or imaginary, but have no other interest in common with these poor unfortunate frame-work knitters. At this moment, we do not hesitate to say that, throughout the whole country, disturbance could thus and otherwise be but too easily excited. There is a chafed feeling amongst these poor frame-work knitters against our legislators, for allowing the iniquity of which they complain to continue, in spite of efforts to put an end to it, so that our legislature as well as our Government, ought to give the subject their most serious attention. Petitions are meantime being prepared, with the view of once more trying to put an end to this frame rent stoppage of wages, allowing the employers of course to substitute a modified rate of money wages for labour actually done. Why should frame-work knitters pay rent for frames any more than ploughmen for ploughs, spinners for spinning machines or steam-engines, clerks for desks, or workmen in general for their masters' benches and workshops?

THE LOCAL MANAGEMENT OF THE METROPOLIS.

THE Bill brought into the House of Commons by Sir Benjamin Hall, for the better local management of the metropolis, seems calculated to effect improvement to a great extent. As it will not be brought up for second reading till the 16th of next month, we may defer particulars for a week. It is much to be regretted that Sir Benjamin Hall should have been led to repeat his charge against the district surveyors for neglect of duty touching the occupation of cellar dwellings, in the face of the legal opinions expressed, and the strong evidence to the contrary which was laid before him.

CHURCH-BUILDING NEWS.

Great Horkesley.—Two windows have recently been placed in Great Horkesley Church, in memory of a late rector. The glass is by Wailes. The subjects are "The Sower," from St. Matthew; "Christ blessing Little Children," from St. Mark; "The Good Samaritan," from St. Luke; and "Feeding the Multitude," from St. John.

Norwich.—Scaffolding has been erected outside the west side of the tower of Norwich Cathedral, and men are now engaged in restoring the exterior, after the original design. The work is being executed under the superintendence of Mr. John Brown, architect to the Dean and Chapter. One of the fronts of the tower was restored in cement some time since; but in the present instance stone is to be used.

Stamford.—We stated lately that the new burial-ground here had been consecrated by the Bishop of Lincoln. The chapels are nearly alike in the interior: they are floored with Minton's Staffordshire tiles, and have stained deal roofs; but the string-course under the plate of the roof is plain in the Dissenters' chapel, while that in the Episcopal chapel is inscribed in illuminated letters.

Tiptree-Heath (Essex).—A new church is to be erected here, to hold 500 persons, at a cost of about 2,000*l.* Messrs. Christian, Laing, Watson, and Hayward, and a gentleman of Colchester have been invited to submit designs in a private competition. The drawings were to be sent in on 17th inst.

Romsey.—Braishfield New Church, erected mainly during the past year, was consecrated on Thursday before last by the Bishop of Winchester. The building has windows of pointed Gothic, with a south entrance. The interior consists of a main and north aisle, the latter having been added at the expense of the Rev. J. Davis, and as a memorial token to his late wife. The church was erected by Mr. Petty, of Wellow, and the benches were fitted up by Mr. Wheeler, of Romsey.

Over Tabley.—The new church at Over Tabley, near Knutsford, Cheshire, was consecrated by the Bishop of Chester, on Tuesday before last. The edifice is situated close to the high road to Northwich. It has no tower. The building is sufficiently capacious to afford the church accommodation required in the neighbourhood, and is similar to the new church at Bollington, near Altrincham.

Harpurhey (near Manchester).—The Union Chapel, Queen's-park, Harpurhey, was opened on Thursday, March 8th. The general plan of the building is in the form of a parallelogram, with a tower on the north-west angle. The tower contains the gallery staircase, and a smaller turret is carried up with it, which has an open belfry, with crocketed spire and vane, altogether 90 feet high. The main entrance is in the centre of the front to Rochdale-road, and is formed with a large archway which spans the porch. On either side the porch are the doors leading to the interior. The roof is of novel construction, having two trussed tie-beams running parallel with the length of the chapel, thus dividing it into three parts. The centre part or nave, extends the full length of the building, and includes the recess which contains the choir at the east end. The roof is overlaid with boarding, and asphalte roofing felt is placed between the boarding and the slates. From the point of the roof are suspended three chandeliers. The back gable is pierced with a circular window filled with stained glass. Underneath the orchestra is a lecture-room, and on one side is the minister's vestry, on the other a staircase to the organ-gallery. The style of the architecture is Decorated, chiefly expressed in the window tracery and carving; the other details being exceedingly simple. The outside length of the building is 90 feet, and the outside width 46 feet. There is now accommodation for 700 persons, and when the side galleries are added, there will be a total accommodation for 900. The cost of the whole, including heating apparatus, gas fittings, upholstery, gates, railings and fences, architect's commission, &c. will not exceed 2,100*l.* The architect is Mr. R. Moffat Smith, of Manchester; and the contractors Messrs. Farrell and Griffiths, of Lower Broughton.

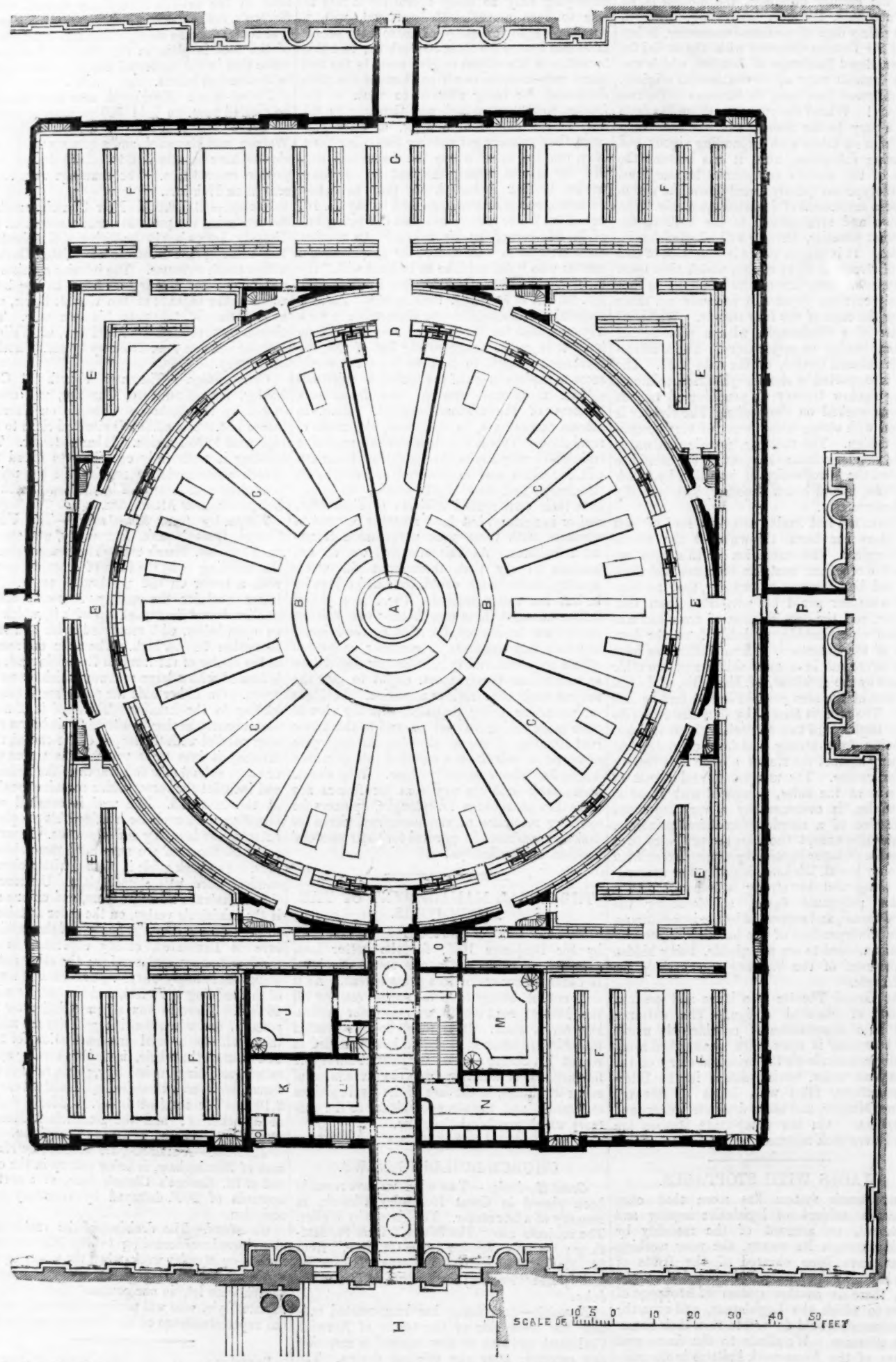
Barnsley.—A stained-glass window, by Hardman of Birmingham, is being put up in the east end of St. George's Church here, at a cost of upwards of 200*l.* defrayed by voluntary subscription.

Gateshead.—The decision of the rector and churchwardens, according to the *Observer*, was formed on Monday week, when the whole of the works required for the restoration of the parish church were let, in one contract, for 1,127*l.* to Messrs Kyle, who will perform their task under the superintendence of Mr. Dobson, architect.

DESTRUCTION OF THE OPERA-HOUSE AT DESSAU.—The Opera-house at Dessau, one of the largest in Germany, was burnt to the ground on Wednesday, the 7th inst. The building was completely gutted in a few hours. The front portion of the building has been preserved.

* A view of this was given some time ago in the *Builder*.

BRITISH MUSEUM: PLAN OF NEW READING-ROOM IN QUADRANGLE.

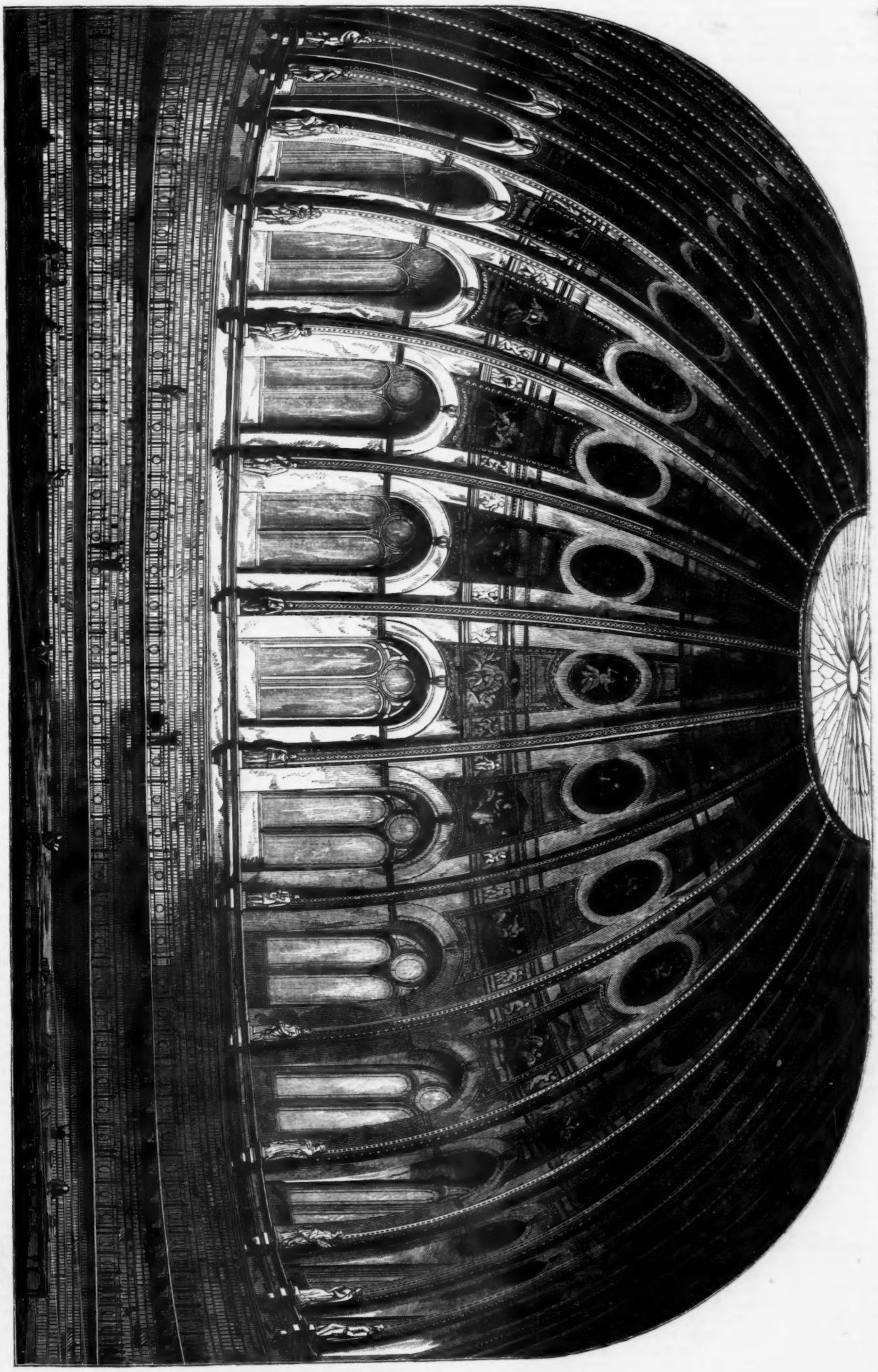


A. Superintendent.
B. Catalogues.
C. Tables for Readers.
D. Access for Attendants.

E. Perforated Gallery.
F. Bookcases.
G. Entrance to new Reading-room from North Library.

H. Entrance Hall, Museum.
J. For Registration of Copyrights.
K. Ladies' Cloak-room.
L. Attendants' Room.

M. Gentlemen's Cloak-room.
N. For Gentlemen.
O. Assistants' Room.
P. Entrance from Royal Library.



THE NEW READING-ROOM, BRITISH MUSEUM.—MR. SYDNEY SMIRKE, A.R.A. ARCHITECT.

[See page 133, *ante*.

THE OPENING OF NEW BRANCHES OF INDUSTRY.

AN anonymous writer in the New World, has somewhat skilfully grouped together many of the wonderful exchanges which free-trade and advancing civilization have effected, and the spirit of enterprise brought to their shores. The picture is almost equally true and graphic when applied to either hemisphere. To take a condensed view of the opening of new branches of industry:—Among the two or three hundred thousand vegetables and animals that God has created, to satisfy our natural and artificial wants, there are very few that we have yet acclimated or domesticated, or know how to employ. However few they may be, we continue to increase them, and our power to make acquisitions would appear to have no limits but those of creation. A considerable number of the plants which grow among us, have been brought very recently from climates quite different from ours. It will be useful to notice this fact.

Thus, Asia has given us hemp, the cherry, the peach, the French bean, the tarragon, the onion, rhubarb, mint, the mulberry, the citron, the lime, the orange, the chesnut, the pine of Siberia, the pine of Jerusalem, the plane-tree of the East, the aloe, the rose of Provence, the mallow rose, the millet, the cypress, and so forth. Grain and buck-wheat we get from the Levant, and the olive from Africa.

Europe has borrowed from America the potato, the maize, tobacco, the banana, the love-apple, the strawberry, the medlar-tree, and a hundred other trees, fruits, plants, and flowers.

Within three or four centuries Europe and America have been literally invaded with vegetables from all parts of the globe. We live almost entirely upon what has been borrowed from other countries, and it is but the advance guard of the immense quantity and variety which science, and the rapid intercommunication between the different parts of the world will give us. We are at liberty to choose from the general herbal of creation all that suits us.

An inventory of all the riches we appropriate would be a long one. It would be almost endless labour to give such a catalogue of creation. To glance at a few only of the alimentary plants,—the *arto earpe* (so precious to the inhabitants of Tahiti), the *sagotier*, the palm cabbage, the bamboo of Celebes (of which the young sprouts have a delicious flavour), the cocoa-tree (of which the fruit is both meat and drink), the gum-tree, the bread fruit, the sugar-palm, the plantain, and banana; the tamarind, the *papaver*, the mangosteen, &c. Among the textile plants, may be noticed the New Zealand flax and the *abaca* (*artica utilis*), a kind of flax in the Philippine Islands and China, of which the Chinese make the most superb stuffs. Of the trees for cabinet-making, for building, and for the masts of vessels, a thousand might be taken from the pines, the cedars, the ebony, the sandal, and the satin wood. Then there are trees which yield us gums, resins, tinctures, and medicines; the spice-tea, and tea-plant; and a number of others, not so useful perhaps, but which would delight us with their beauty and fragrance.

To speak of the animal kingdom: how many more kinds might we domesticate than we have? M. Jeoffry St. Hilaire cites several in his memoir upon the utility of a menagerie of acclimatization, those great antelopes, which would furnish an abundance of healthy food; the Peruvian sheep, of which the wool is so fine and soft; the tapir, larger than the pig, and as easy to feed, the flesh of which is very agreeable and wholesome, and which might be made useful as a beast of burden; the lama, the alpaca, &c. Again, among birds, if we direct our attention to the subject, we shall discover many other kinds worth introducing or domesticating, for their flesh, their eggs, or their beauty. With respect to fish also, our rivers or our streams and small lakes could be peopled with a vast multitude and variety of the finny tribes. Fish increase very abundantly, and science will teach us to transform those of the sea into fresh-water fish. Carp did not appear in England till the sixteenth century, and the plaice of the North Sea have multiplied infinitely in the ponds of the New World.

PROVINCIAL NEWS.

Lynn.—The Public Baths Committee here, having come to a resolution in favour of annexing washhouses to the baths already decided on, have called a meeting of the subscribers to consider that proposal.

Newark.—Since the destruction of Kelham-bridge, the county magistrates have met and resolved to re-erect a new bridge on the same site. They have appointed a committee to ascertain as to whether the new bridge should be of stone or on the suspension principle.

Clitheroe.—Out of the four tenders selected from eighteen, received by the directors of the Clitheroe Waterworks Company, for making a reservoir and laying upwards of twelve miles of main pipes, the tender of Mr. Ibbetson, of Blackburn, was selected. The works are now being carried out from the designs and under the directions of Mr. McLandsborough, of Bradford, the company's engineer.

Oldham.—One day lately, eighty-three persons were summoned before the General Purposes Committee, and fined 2s. 6d. each, for not having whitewashed their dwellings within seven days after the 1st of March.

Chester-le-Street.—The local guardians are about to erect a new workhouse here, on an elevated site south of the town, and from the designs of Mr. Matthew Thompson, of Newcastle, architect.

Newcastle and Gateshead.—"Our friends at a distance," says the *Gateshead Observer*, "are often sorely perplexed by the sister boroughs at Tyne Bridge." In reference to a note of ours as to a music-hall, it is then explained that "the Mayor of *Gateshead* was presiding over a company in *Newcastle*, when he threw out the invitation to his fellow members of the Sacred Harmonic Society; and it was in that town that the 'castle in the air' was to be conjured into existence."

Witton.—The Wear Valley Railway-bridge across the Wear, at Witton Park, has been completed. It is built (on piles) in stone, with six brick arches, and is 375 feet in length. The rails run at the height of nearly 68 feet above the level of the water, and the parapet is nearly 71 feet above that level. The three centre arches are askew at an angle of 66 degrees, with a rise of 22 feet, the span of each being 66 feet on the skew, and 60 feet 3 inches on the square. The two end arches are square, with a span of 47 feet, and a rise of 19 feet 3 inches.

ROAD BOOKS TO ART.*

"IF from all that has been written on painting," says Mr. Leslie, in his preface to "A Hand-Book for Young Painters," the truth could be brought out, and presented clear from every ambiguity of language, the student of the present day would stand in little need of further guidance." And his aim has evidently been to strip theory of ambiguity, in imparting the knowledge derived from years of practical experience, and to assist in clearing a proverbially long, toilsome path of some of its besetting brambles, difficulties almost sufficient to discourage the most adventurous of aspirants.

The lectures delivered at the Royal Academy, during the author's professorship, form the basis of this very interesting volume, which independently of its value to the student, has a charm for the most general reader. While recommending it cordially, we would remind "young painters," that the necessity for individual exertion—manual and mental—precedes theory, however preceptive and comprehensive—there is very much more to be learned besides laws and rules; yet the guide is indispensable—practice is as likely to lose its way by lagging behind as getting too far in advance of it. It must further be remembered that, "it is not the length of time spent in study that is to make a painter of you, but *how* you spend that time. Try to keep in mind the greatest things, and secure these first."

It must not be expected that rules will give a royal road to art. "There is, I believe," says our author, "a good deal of what may be called honest quackery among painters; quackery, I mean, which those who practise it mistake for sound doctrine. One safeguard against this is, to beware of all rules that promise an easy acquirement of the art, and to mistrust our own dexterity when we find it saving us the labour of thought."

"There is no easy way of becoming a good painter", wrote Sir Joshua Reynolds, and it is an undeniable fact. Early use of the brush is advocated, and fine colour considered as essential an element as fine drawing. "But colour, it is, said, is sensual as addressing itself to the sense of sight only, and not to the mind."

After ably combatting this objection, Mr. Leslie says, "I can never, therefore, think that Venetian or Dutch colour can do otherwise than exalt the highest subjects; and it seems to me a most injurious error for painters to consider colour a thing that may be either neglected as a minor excellence, or deliberately rejected as inconsistent with other qualities."

Instruction, founded on thorough knowledge of the subject, conveyed so concisely as it is in this volume, can be appreciated by any reader.

The illustrations that embellish it are well selected, as examples of the various great masters, and make it a book for the drawing-room as well as the studio.

A series of very useful lessons in water-colour drawing, has been compiled by Mr. George Barnard, in his "Theory and Practice of Landscape Painting," in which Messrs. Leighton, Brothers' chromatic process proves an efficient assistant to the amateur and an admirable auxiliary in demonstrating the directions of the master to the pupil. With very little other help, one might cultivate a taste for sketching from nature, and those who are at all advanced in acquiring the ability, will be wise to avail themselves of the means afforded by this treatise of furthering it.

Mr. Charles Martel dissertates cogently, chiefly on the modification of colour by contrast, as pointed out by Chevreul, and makes a variety of useful deductions for the advantage of those who will not trouble themselves to master more elaborate works.

* "A Hand-Book for Young Painters." By C. R. Leslie, R.A. (John Murray, Albemarle-street.)—"The Theory and Practice of Landscape Painting in Water-Colours." By G. Barnard. (Wm. S. Orr and Co. Amen-corner.)—"The Principles of Colouring." By C. Martel. (Winsor and Newton, Rathbone-place.)

STREET-WATERING.

ON a hot day, near the end of last July, I saw in the clean-swept streets of Cambridge what I do not remember to have seen anywhere else, namely, water, pure and bright, from a public fountain, running in the channels outside the footpaths,—and the effect was most grateful to the senses. If I mistake not, the water is brought by the small canal, named Hobson's stream, to the fountain in the market-place, and is there set free, to proceed on its refreshing and purifying mission. An excellent individual, no doubt, was Hobson; and happy are the dwellers on the classic Cam in having been peculiarly that Hobson's choice. The water, be it noted, comes by way of the *Trumpington-road*. The channels (not kennels), I think, were sunk and parallel, and, therefore, tidy, and easy to step over.

It has occurred to me that the above method of watering the streets might be much improved upon, for the Cambridge carriage-ways were quite dry. In those of the leading thoroughfares of the metropolis, I should think, rectangular cast-iron pipes, narrow and deep in their proportions, might with advantage be sunk, flush with the surface, transversely to the direction of the street, connected with the mains of the water-companies, and perforated along their upper side, to permit the escape of the water. The water-cart in those thoroughfares would thus be superseded, and their contents no longer, at the touch of the driver, take the shine out of our boots: the way would be cleared of a slow-going vehicle, and the distribution of the water would be more equable. A turncock would have the charge of turning on the water, and would adjust the pressure, so that it should just run over at the perforations: the longitudinal slope and transverse convexity of the street would carry it forward, with a sideward tendency: the distances of the pipes would be regulated with reference to the efficiency of the slope, which few streets are without, it being usually given to them, for drainage purposes, where the ground may happen to be level. Where the street was but slightly inclined lengthways, a herring-bone arrangement of the pipes would ensure the water performing its office before running off at the sides; and if in any case it was perfectly level, they might might be laid longitudinally in the centre.

J. W.

THE INSTITUTION OF CIVIL ENGINEERS AND THE METROPOLITAN SEWERS COMMISSION.

SIR,—In the course of a recent discussion, at the Institution of Civil Engineers, on the flow of water through pipes, reference was made to a paper of mine, published by the Metropolitan Commissioners of Sewers, and entitled "Memorandum on the Data employed by Mr. Bazalgette in determining the Sizes and estimating the Cost of the Works designed for the Main Drainage of the Metropolis."

The first paragraph of this paper, which was quoted, in terms of disapproval, by one of the most distinguished speakers on that occasion, runs as follows:—

"Mr. Bazalgette has, I think, fallen into unintentional error, in his mode of applying the formula he employs to calculate the sizes of the great intercepting sewers.

He says ('Data,' p. 4) that the various formulæ propounded lead practically to the same results. So far is this from the truth, that De Prony's formula, based on the results of Dubuat's experiments, leads to conclusions totally different from those obtained by Eytelwein's formula, with the modified co-efficients which he deduced from the experiments of Brünings, Woltmann, and Funk, on larger streams of a wider range of velocities. De Prony's formula applied to this latter class of cases, gives results which, as Claudel states ('Formules,' p. 110), deviate in some instances from the truth by no less than 29 per cent. The approximate formula adopted by Mr. Bazalgette, and applied in the manner he describes, to determine the discharging power of each tunnel, 'at all those points where a change in its dimensions has been made,' leads necessarily, I think, to fallacious conclusions.

For, the discharging power of any point (*a*) of the tunnel assumed as running full bore, having been thus computed, it is assumed by Mr. Bazalgette that any additional influx brought into the tunnel by a branch *below* that point, would require as much increase of capacity as an equal influx *above* that point,—a conclusion obviously erroneous.

Mr. Bazalgette's mistake lies, I think, in the assumption of constant parallelism between the declivity of the running stream and that of the channel in which it flows; whereas this parallelism is liable, in the case of sewers receiving branches, to continual disturbance; seeing that, while the declivity of the channel remains fixed, the declivity of the stream varies with every increase of its velocity.

Such increase of velocity is doubtless partly determined by the accelerating force of gravity, as the stream runs down the channel; but it partly, also, results from the head or momentum of the branch streams coming in, and producing a quickened flow of the resultant mass.

Hence it happens that a tunnel running full bore at the head may take in a number of collateral streams at different points of its course, without requiring any increase of its capacity; room having been made (so to speak) for the additions, by the quickened speed, and therefore diminished section of the original stream."

In the course of the debate, as reported in a paper issued from the private press of the Institution, certain experiments conducted by Mr. Medworth, under the Trial-works Committee of a former Commission, and referred to in my "Memorandum," were stated "to have cost 7,000*l.*;" "to have been tampered with and perverted, apparently with the object of fitting them to preconceived theories;" and "to have given results utterly worthless for all practical purposes."

In stating that the experiments in question cost 7,000*l.* the eminent speaker fell into an error, which I have no doubt was inadvertent, and which, I am sure, he will be the first to acknowledge and regret. The accountant of the Metropolitan Sewers Commission, to whom I referred this point, assures me that the sum in question includes the whole cost of all the experiments ever made by the Trial Works Committee, as, for instance, the sewage irrigation experiments, the street cleansing experiments, the establishment of improved kilns for the manufacture of pipes, hollow bricks, &c. besides sums expended in clothing for the men, and in other stores available for general purposes. I have requested the accountant to dissect the figures; and I shall have much pleasure in communicating the result to the honourable Institution of Civil Engineers, who, I am convinced, will readily withdraw an imputation which they will see to be groundless.

With reference to the speaker's assumption that Mr. Medworth's experiments on waterflow were "tampered with and perverted to fit them to preconceived theories," there is sufficient internal evidence in the printed results of the experiments, to exonerate Mr. Medworth from this very serious charge; which must, I think, have escaped the speaker in the warmth of impromptu debate. Thus, for instance, in one of Mr. Medworth's diagrams, showing the time required to discharge 50 cubic feet of water through 100 feet of 4-inch pipe, laid at varying inclinations, and with varying heads, the velocity of discharge is seen to have increased with the declivity up to 1 in 120; but at higher rates of fall the results appear anomalous and irregular, an increase of slope from 1 in 80 to 1 in 10 giving often no appreciable improvement of the discharge. This curious, and at first sight perplexing result is, I think, susceptible of explanation; in which opinion I have the concurrence of an engineer whom I have consulted on the point, and who is profoundly conversant with this department of hydraulics. But the faithful record of anomalies so likely to excite suspicion of his care and accuracy, tends, I think, to prove that Mr. Medworth simply stated what he saw, and was too honest to "tamper" with his results.

In reply to the allegation that these experiments were practically worthless, I would point to the incontestable value of one of the results they elucidated; the only one, indeed, on which, in the paragraph quoted from my paper, I had occasion to lay stress, viz.—that a pipe, fed by branches at intervals along its course, discharges more than a similar pipe supplied only at the head.

The honourable Institution of Civil Engineers will not, I think, on consideration, deny either the fact here stated itself, or its practical bearing on the determination of the size and cost of Intercepting-sewers. These sewers will receive collateral streams at many points along their course; and it would be a waste of public money to provide in the main tunnels an amount of space equal to the collective areas of all the tributaries. A tunnel so calculated would certainly never run full; and its excessive capacity, while increasing its cost, would impair its scour, and render it more apt to silt up.

These experiments, and others of the same sort, made under the Trial-works Committee of the first consolidated Commission, though, probably, like those on which Eytelwein and De Prony themselves rely, open in some respects to criticism, prepared the way for the introduction of tubular sewers and drains, of which 380 miles, varying from 3 inches to 20 inches in diameter, are now working successfully in London, with a saving of more than 200,000*l.* cost to the public. This splendid result surely justifies the relatively trifling outlay that was incurred in the experiments which prepared its achievement.

With respect to a passage quoted in my "Memorandum" from Claudel's "*Formules*," p. 110, to the effect that De Prony's formula, when applied to a particular class of cases, gives results deviating from the truth in some instances by no less than 29 per cent. it is stated in the authorized report of the debate, that on reference to the work quoted by me, "it appeared that no such passage existed."

In reply to this grave imputation, I subjoin, in Claudel's original French, the passage referred to, of which, for convenience, I add a literal translation:—

"La formule de Prony, modifiée par les nouvelles valeurs de *a* et *b* d'Eytelwein, convient mieux au cas des grandes rivières; mais elle ne s'applique pas également bien aux quatre-vingt-onze expériences discutées par Eytelwein; ainsi, pour vingt d'entre elles, les vitesses données par la formule s'écartent de 0·11 à 0·29 des vitesses observées."—*Formules, &c. par J. Claudel, p.* 110. *Paris*, 1849.

"The formula of Prony, modified by Eytelwein's new values of *a* and *b*, applies better to the case of great rivers; but it does not agree so well with the ninety-one experiments discussed by Eytelwein; thus, for twenty of them, the velocities assigned by the formula differ from the observed velocities by from 0·11 to 0·29."

The minimum deviation here stated, it will be observed, is 11 hundredths, and the maximum, 29 hundredths, *i. e.* 29 per cent.

The report contains other charges, susceptible of equally easy refutation; but I forbear further discussion of these ungrateful themes. I will not believe these errors, authoritatively promulgated as they are, to be otherwise than inadvertent; nor will I suffer them to diminish my esteem for the engineering profession, whose many splendid works I regard as an honour to our country. The engineers, on their part, will not I hope take amiss my brief refutation of charges, reflecting not only on my own character, but also on that of the Commission to which I have the honour to belong.

F. O. WARD.

A FEW THOUGHTS ON THE STATE OF THE FINE ARTS IN ENGLISH SOCIETY.

IT is a theme, I believe, often played upon by our continental neighbours, that the English, as a nation of shopkeepers and contractors, have no taste for the fine arts. As an Englishman, and one professionally engaged in one branch of the fine arts, I feel a pang of regret come over me, because it is in a great measure true. Should any one doubt this, I would advise him to do as I have done, viz. go to the fine art corridors of the British Musum, the National Gallery, and the Architectural Courts of the Crystal Palace, and watch the visitors, and listen to the remarks of the varied groups who come and depart, and he will then find that two-thirds of the number will either excite his pity or contempt, and in many instances both. The ignorance of the concatenation and history of art, together with the elements that constitute the really beautiful in a work of art, be that art architecture, painting, or sculpture, is often as great in the educated gentleman as in the unlettered ploughman. This is a defect wofully seen in the greater portion of the middle classes of society, thus proving that the defect is owing in a great measure to our systems of education, in which the fine arts are almost universally left in the back-ground, as if they were some dry philosophic lore. If we turn to our mechanics' institutes, our literary and scientific institutions, scattered throughout the length and breadth of our land, what do we find the general tone of their lecture-lists to be? Alas! far from what they ought to be. They are generally replete with lectures of mere amusement, a scientific lecture being the exception. I have seen many in the western, eastern, midland, and southern counties, and such has been my experience. Their various committees seem to pander to the public instead of endeavouring to elevate it—to raise the higher and intellectual portions of our nature to their proper position. To accomplish this is no mean object; but this is the mission of the fine arts to

"This dim spot which we call earth."

Truly is the ark of science and the fine arts afloat on some unknown sea, and we can scarcely trace her course through the clouds which every way gather round her.

Music for some has no charms: poetry for others has no perspicacity or beauty: the sublime conceptions displayed in a great painting, to some are a dead letter: to others, the Minerva of Phidias would be no more than a mere mass of marble, carved into the shape of the human figure; or perhaps the beauty of the marble would excite more of their attention than the grandeur of art displayed in the proportional parts, and the exquisite beauty of the anatomical portions; whilst in the other, the vivacity of the colours raise the value of the picture more than the genius evinced in its conception. But on by far the greater number, the lines of beauty conveyed by architecture in living representations to the soul, rest there as if in the soul of an automaton.

"Surely the time shall come
When this fine overplus of might,
No longer sullen, slow, and dumb,
Shall leap to Music and to Light."

So sang the poet, and shall it not be so? Of a truth the fine arts shall yet ascend to their proper position in the scale of our being, for their study cannot fail to lead our minds

To truth's eternal source,

and enable us more and more to glorify the Almighty Creator of the Universe.

F. E. D.

BUILDERS AND THEIR TENDERS.

Burial-Board Equity.—The Portsea Burial Board, anxious doubtless to do their duty to the ratepayers who are their constituents, by getting the chapels and other works at their new cemetery erected at as reasonable a rate as possible, advertised for tenders to that effect, and obtained ten separate offers, ranging in amount from 4,516*l.* to 3,605*l.* 12s. The right man not appearing on this list to be in the right place, the Board directed the cards to be shuffled again, on the ground that the sum total must be reduced as much as possible, by the omission of something that could be dispensed with, as well as by the competition of the tenderers themselves, eight of whom were accordingly again applied to for new and reduced tenders. Four of those applied to do not seem to have thought it prudent or worth while to waste any more time, so that four only of the original tenderers remained to be dealt with. Now it so happened that the lowest tenderer on the first list was also the lowest on the last, and that accordingly, having thus doubly committed themselves, by a special and formal second request that he in particular *would* tender, thereby foreclosing themselves from all pretence of rejection on the score of insufficient respectability or anything else objectionable on the part of the tenderer, Mr. Callaway,—the Portsea Burial Board were of course bound, in honour to themselves as well as in justice both to their constituent ratepayers and to their tenderers, to accept the terms on which Mr. Callaway had thus twice secured the preference. Nevertheless, this only fair and honourable way of settling the matter was not taken. The tendering firm who stood the highest, on the first list, of all the four who latterly re-tendered, were the favourites of fortune. The amount of their first tender was 4,200*l.* The amounts of reduction made by the other three tenderers of the second order were

respectively 663*l.* 10s., 515*l.*, and (Mr. Callaway's), 501*l.* 8s. The firm who were destined to have the preference, right or wrong, made a strong effort certainly to deserve it, for they cut off 1,025*l.* from their first tender: still, however, they stood 70*l.* short of the mark, and it remains for the Portsea Burial Board to explain to their ratepaying constituents why they chose to make a clear present of 70*l.* out of the ratepaying pockets to any favourite of their own.

Withdrawal of Tenders.—Messrs. Faudell and Co. complain that, having received tenders from four well-known builders, varying from 1,100*l.* to 417*l.* for certain proposed alterations, the firm who made the lowest tender have since declined to ratify the contract: they wish to know the custom on this point and our opinion. Although not a desirable proceeding, it seems to us there are various circumstances which might justify such a course. If, as in this case, for example, the parties tendering discovered an important error in their calculations before entering into *mutual* engagements, we should certainly not think it dishonourable if they declined to proceed farther. What the legal position of the parties may be we cannot say: this would depend on the special facts of the case.

THE ART-UNION OF LONDON ILLUSTRATIONS.

THE volume of "Illustrations of Childe Harold" produced by the Art-Union of London (to a copy of which *every* subscriber of the current year is entitled, in addition to an engraving after Chalon), is by far the best set of wood engravings yet issued by that Society; in fact, it would scarcely be too much praise if we said it is the best thing of its kind yet done. It contains thirty designs by Ansdell, Cope, R.A., Corbould, Dodgson, E. Duncan, Faed, James Godwin, F. Goodall, A.R.A., Gilbert, Holland, Hulme, Hart, R.A., Leitch, Lake Price, H. C. Selous, Tenniel, and Wehnert, and a portrait of the poet. The engravers are Messrs. J. L. Williams, Dalziel, J. Thompson, W. J. Linton, W. Measom, H. D. Linton, W. T. Green, F. J. Smyth, and M. Jackson. Many of the designs are remarkable for a poetical feeling and sentiment not often found in wood engravings; take, for example, the "Bridge of Sighs," by Mr. Lake Price,

> "A palace and a prison on each hand;"

the Hall of the Childe's Father, by Mr. Hulme, bathed in a flood of moonlight; Mr. Faed's Rustics gazing after a departing Son (though a reversal of the lines quoted); and Mr. Ansdell's illustration of,—

> "Then to the dogs resign the unburied slain,
> Then to the vulture let each corse remain."

Mr. Leitch's Storm amongst the Mountains,—

> "With night, and clouds, and thunder, and a soul
> To make these felt and feeling;"

Mr. Tenniel's Baronial Feud, where love,

> "Through all the mail of iron hearts would glide;"

Mr. Wehnert's "Tasso,"—

> "Hark to his strain! and then survey his cell!"

and Mr. Duncan's rendering of the magnificent apostrophe to the sea, beginning—

> "Roll on, thou deep and dark blue ocean—roll!
> Ten thousand fleets sweep over thee in vain;"

all demand more than ordinary admiration.

Mr. Cope illustrates The Departure,—

> "The sails were filled, and fair the light winds blew;"

Mr. J. Godwin,—

> "Maidens, like moths, are ever caught by glare;"

and Mr. Hart, "Blind Old Dandolo," and "The starry Galileo."

We must add, that Mr. Murray is preparing an edition of the poem, in 4to, expressly for the use of those members who may desire to bind up the text with the illustrations of which we have spoken.

Notices of Books.

VARIORUM.

"THE Golden Colony; or, Victoria in 1854," is a neat little book by Mr. G. H. Wathen, known to our readers as the author of "Arts, Antiquities, and Chronology of Ancient Egypt." The present volume (published by Messrs. Longman and Co.) embodies much interesting personal experience in the colony and among the gold-diggers, from the first dawn of the golden sun of Australia down to a recent period. It is illustrated with original sketches, by the author, including some characteristic traits of the "diggins;" and also contains remarks on the geology of the Australian gold-fields, with maps, &c. The whole forms a pleasant as well as instructive compendium, both for emigrants and for those who have no intention to emigrate.——"Fenn's Compendium of the English and Foreign Funds," &c. is a reliable work, revised and re-edited by Mr. H. Ayres, the editor of the *Bankers' Circular*. It contains a large mass of information as to the funds, debts, and revenues of all nations, banks, railways, mines, and joint-stock companies, forming in all an epitome of the various objects of investment and speculation negotiable in London; with explanatory tables, and stock-exchange regulations. The present is the fifth edition, but though nominally Fenn's, it is really Ayres's as much as if it had been an old building, comprising valuable building materials, re-erected into a new and more extensive mansion. With the date 1855 on the title-page, however, we ought not to meet with a slip such as the following, touching the 3¼ per cent. annuities. "The present rate of interest on this stock is to continue until the 10th of October, 1854, and then to be reduced to 3."——Messrs. Trübner and Co. of Paternoster-row, have just issued in this country the Boston "Annual of Scientific Discovery, or Year-book of Facts in Science and Art for 1855;" edited by Mr. D. A. Wells, A.M. Those who possess the previous volumes of this valuable annual will be glad, we are sure, to know that a new one is now in store for their perusal.——"Mensuration made easy; or, the Decimal System for the Million, with its Application to the Daily Employments of the Artizan and Mechanic," is a shilling tract published by Mr. Wilson, of the Exchange, and prepared by Mr. C. Hoare. It seems to do justice to its title, and is simple and intelligible.——Mr. J. J. Scott, Barrister-at-Law, has had published by Knight and Co. Fleet-street (the publishers to the General Board of Health), two useful little volumes, or tracts rather, one a manual for the Clerk to a local Board of Health, containg directions and instructions as to his appointment, duties, responsibility, &c. so that any one who wishes or requires to look into the duties of such an office can now do so without wading through various tedious Blue Books, or Parliamentary Acts. The other is a "Guide for Burial Boards," under the Metropolitan and Local Burial Acts, with respect to fees and charges for interments, monuments, &c. with all the sections of the Acts relating to the subject, and various scales of fees charged by burial boards, both at home and abroad, and miscellaneous information thereon.——Mr. S. C. Gant, C.E. Engineer and Surveyor to the Merthyr Tidvil Local Board of Health, has had published by Messrs. Longman and Co. and Knight and Co. "Notes and Queries on the Public Health Act, 1848, with Suggestions for a new Bill." The object of this pamphlet is simply to direct the public attention to the difficulties experienced in the working of the Act. Mr. Gant is of opinion that local Boards of Health should be virtually Gener al Improvement Commissioners as well as trustees for the public health.

Miscellanea.

NORTH BIERLEY UNION WORKHOUSE COMPETITION.—The competition for the North Bierley Union Workhouse, was decided on Monday last in favour of Messrs. Lockwood and Mawson, architects. The building is for the accommodation of 400 inmates, properly classified according to the requirements of the Poor Law Board, with every requisite convenience suitably arranged for each class of inmates, and a detached infirmary for the accommodation of 50 patients. The elevation is in the Italian style of architecture. There were 15 competitors, and the plans of Mr. Milnes, of Bradford, obtained the next number of votes.

PATRIOTIC FUND ART EXHIBITION AND SALE.—An influential list of patronesses and patrons has been formed for the purpose of obtaining a collection of Works of Art, by artists and amateurs, for exhibition and sale; the amount so raised to be applied to the relief of the widows and orphans of British officers, who may fall in the war with Russia. The exhibition will be open in the last week in March (the current week of this announcement) at the Gallery, 121, Pall-mall. All the contributions were to be sent in by the 16th inst. By Her Majesty's special permission, the Princesses will contribute drawings and other of their works. If they are as good as some we have accidentally had a sight of, they will be eagerly sought for.

NEW DETACHMENT OF NAVVIES.—A body of 2,000 "navvies," says the *Times*, is going out to the Crimea, to do all that digging and trenching work which, rough as it may seem, requires as much apprenticeship as a soldier's proper trade. The soldier, for the future, is to be reserved as much as possible as the fighting man. These "navvies" are to be victualled by contract: they take out their own houses, their own chief, Mr. Cochrane, who did most of the work of the Crystal Palace at Sydenham under the contractors. It is a great experiment in the work of commissariat, and, as civilians are the subject of it, it is endured in military circles.

EDINBURGH ARCHITECTURAL INSTITUTE.—At a meeting of the Institute, held on Thursday night, in their hall, George-street, Mr. M. Rhind in the chair, Mr. D. R. Hay read a paper, in which he touched on the present state of the fine arts in connection with science, and threw out a number of striking views in relation to the laws which govern architectural proportions. A discussion followed, in which the chairman, Mr. Cousins, Mr. Peddie, and Mr. Ballantine took part.

A CAMP IN IRELAND.—Messrs. Courtney and Stephens, of Dublin, have received government orders for the erection of 450 huts and stables for a camp about to be formed on the Curragh of Kildare. The work was to be completed in sixty days from Wednesday before last, and if before a premium to be granted. The contractors are employing upwards of 600 men, 450 of them carpenters. It is said to be estimated that the contract will amount to 40,000*l.*: this would be equivalent, however, to about 90*l.* a hut, so that unless these and the stables are very large and extensive, there must surely be some mistake in the amount of estimate named.

THE NEW CONSUMPTION HOSPITAL IN VICTORIA PARK.—The visitors to the Victoria-park will have remarked a stately edifice at its south-eastern angle. This is the new Consumption Hospital, of which the foundation-stone was laid by Prince Albert, in 1851, and which now, after a long delay, occasioned by a deficiency of funds, is about to be opened. It appears that the building has cost about 21,000*l.*

THE MARYLEBONE EXTRAMURAL CEMETERY has been consecrated. According to the daily papers, the St. Marylebone Extramural Cemetery is situate at East End, in the parish of Finchley, and is in extent about 26 acres. It possesses a frontage to the public road, and is about half-a-mile distant from the cemeteries of St. Pancras and Islington, the consecration of which took place in July last. The cemetery is entered beneath an arched gateway, and a circular carriage-drive leads to the Episcopal Chapel, situate midway between the entrance and east lodges. The church is of a cruciform character, with open bell-turret and spire on the nave or western gable, 70 feet in height, strangely placed, if the view we have seen be correct. On each side of the entrance, entered under cover of the church, are waiting-rooms and conveniences for persons in attendance on funerals. The edifice is pewed to accommodate 120 persons. The roof is open. The architects are Messrs. Barnett and Birch, and the builders are Messrs. Higgs and Cullingford. The total expenditure, including the purchase of the land, is said to be about 20,000*l.*

MASTERS AND MEN.—At an entertainment recently given by the Westminster Marble Company to their workmen, it was stated that in connection with the marble works, Mr. Hartley had established a Masons' College for the improvement of his apprentices. During the past year, a statistical account has been kept of those residing in the college and those residing out: the result shows that the out-door apprentices have lost in value of time 42*l.*; whilst the indoor apprentices of the same number have lost 11s. only.

THE PARIS EXHIBITION. — The department of Science and Art have published a report on the results of the preliminary measures adopted for transmitting works of industry and art to the Paris Universal Exhibition. It seems not to include the section of Fine Arts. Mr. Henry Cole, C.B. will have the general superintendence on the part of England.

BALMORAL.—Allow me to express to you the pleasure I have derived from inspecting the plan in the *Builder* of Her Majesty's new palace at Balmoral. It is quite a treat to an old Jacobite Scotsman, even though he is now a resident in Canada, to learn that a royal palace is in progress of erection in the highlands of Scotland. I will not criticise the building, but am impelled to notice what appears to me a strange omission, viz. that no provision seems to be made for a chapel. That a royal palace, in the nineteenth century, should be erected for the head of the English Church, without a chapel for domestic use, wherein the sacred rites of the distinctive religion which Her Majesty so solemnly professed at her coronation may be decently and reverently celebrated, does seem to me a strange omission.

AN OLD SCOTSMAN.

Cobourg, Canada West.

THE LATE JOHN MARTIN'S PLANS FOR IMPROVING THE THAMES.—We have had more than one inquiry concerning the plans designed and prepared at so much cost of thought and money by the late Mr. John Martin for the improvement of London; and one writer is under the impression that they are in the hands of some who have no right to them. We find, however, that the drawings are all in the safe keeping of Miss Martin, the painter's daughter, who, more than any one else, aided her father for years in setting forth his views, and bringing them under the notice of persons interested in the matter.

GRATUITOUS ARCHITECTS.—A building committee required the assistance of a professional architect in the decision of some plans sent in through the public competition. But being in want of a job, he proposed that he should be the architect *gratuitously*, and his services were accepted on these conditions. Now, is it usual for the gratuitous architect to receive a bonus or a per-centage from the contractors? and if so, at what per-centage, so that it can be added to the contract? Secondly, is it usual for a professional gentleman so placed to take into his care certain plans, in order (as the secretary said) to cull some ideas from them; and that after keeping the drawings about six months, they should be returned, without even thanks, in not the most cleanly state?—A. B. C.

ST. GEORGE'S, SOUTHWARK.—RUINOUS BUILDINGS.—Mr. Combe is clearly wrong in not allowing the expenses of hoarding to the overseers. The wording of the Act is explicit, as are also the obvious intent and meaning of the same. Mr. Day should at once proceed by requisition to the official referees, requiring them to determine the liabilities or non-liabilities in question by award under their seal. The Act provides that all matters of doubt, dissatisfaction, and dispute, may be referred to them (sec.82). Such a course is more clear, than to call upon a police magistrate to interpret the complicated points arising under the Buildings Act. A real Metropolitan Buildings Court is what is wanted.—FIAT JUSTITIA.

THE IRON FOUNDRY TRADE.—Mr. Edington, of Glasgow, gives the following list of contracts likely to be given out during 1855:—Water-pipes for Melbourne; water-pipes for Litchfield, Walsall, Wednesbury, Bilston, Darlaston, Willenhall, Sedgeley, Tipton, West Bromwich, Rowley Regis, Dudley, and Old Bury; chairs, &c. for the Rhymney Railway Company, South Wales; water-pipes for Hamilton, Canada West, and other towns in Canada; additional chairs, waggon wheels, axles, &c. for Nova Scotia Railway Company; chairs, &c. for extensive railways in South Australia; iron cannon, shot, gates, railings, &c. for East Indies; water-pipes for Loch Katrine scheme; additional quantities of cast-iron cannon, mortars, shot, and shells, for the Government; gas-pipes, &c. for Calcutta, Valparaiso, Liverpool, Haverhill, Beccles, &c.; water-pipes for Wallasey, Grantham, Grimsby, Kelso, Beccles, Halifax, &c.; additional railway chairs for the East-Indies and Canada.

NASH AND JEWELL'S SAFETY SASHES.—This appears to be a very practicable arrangement for the purpose of preventing accidents during the cleaning or painting of upper windows. The inventor claims for it, that the sashes may be reversed with the greatest ease by the most inexperienced servant, and the outside of the window cleaned with perfect safety, and with a great saving of time; that they present the same appearance as the ordinary hanging sashes, and are perfectly air-tight, and free from any possibility of shaking, as they act by means of springs, instead of balance-weights and lines; that the whole space of the window may be opened to afford full ventilation; and that old sashes may be altered to act on this principle without disturbing the frames.

DRAINING THE GASES FROM SEWERS.—A report from Mr. Gurney, on his experiment for draining the noxious gases from the sewers in the neighbourhood of the Houses of Parliament, recently published, asserts that perfect success in this respect has attended the use of the steam jet, and that the gases were decomposed.

LIMITED LIABILITY IN PARTNERSHIP.—Lord Palmerston has announced his intention to bring a Bill before the Commons on this subject.

THE CONSERVATIVE LAND SOCIETY.—At the tenth quarterly general meeting of the members of this society, held on Wednesday, the 14th inst. the accounts showed an excess in the receipts of the quarter. The gross receipts up to the date of the report were 163,509*l.* 19s.; less withdrawals, 152,730*l.* 6s. 4d. The total number of shares issued to March 10th was 10,729. The returns of the sale of land showed the following results:—

	£.	s.	d.
From Michaelmas to Christmas, 1854	2,985	0	0
From Christmas to March 10th, 1855	7,892	10	0
Total land sold in less than 6 months	10,877	10	0

The total sold during the operations of the society amounted to 102,994*l.*

THE COLOSSEUM, REGENT'S-PARK.—When the Colosseum, in the Regent's-park, with the Cyclorama, in Albany-street, were put up to auction, at the Auction Mart, by the Messrs. Winstanley, the other day, the auctioneer stated that the Colosseum was erected after a design by Mr. Decimus Burton, at a cost of 23,000*l.* for Mr. Thomas Horner, who held a lease of it direct from the Crown, at a ground rent of 262*l.* 18s. for a period of ninety-nine years, sixty-nine of which were unexpired on the 10th of October, 1854. He subsequently expended above 100,000*l.* to carry out the objects for which it was intended, by decorating the interior, purchasing the pictures, &c. In August, 1836, the lease was sold to Messrs. Braham and Yates. Mr. Braham laid out about 50,000*l.* on the building, which in a few years afterwards became the property of Mr. Turner, who added the Cyclorama, which cost 20,000*l.* to the establishment, with many decorations, which cost several thousand pounds, so that the entire edifice has cost above 200,000*l.* The sum of 20,000*l.* was bid, but as this was below the reserve price, the property was not sold.

FALL OF BUILDINGS.—Accidents of this kind have been rather frequent of late. During Saturday night before last, according to the local papers, a portion of two of the arches of the west end of the New Market House, at Bolton, fell to the ground. The fourth pillar from the west end, and the third from the east, had sunk at the foundation two feet, thereby causing the fall of the arches of which it was the support. The fall is about 52ft. by 42ft. The iron pillar which supported the beam for the roof snapped at the top, and fell into the vault with the ruins of the arches, and the adjoining pillar to the west was also broken by the weight suddenly thrown upon it; but the heavy iron beam which rested on the fallen pillar remained in its position, though much strained for want of support.——Between 30 and 40 yards of the outer north wall of the General Prison of Perth, lately fell, and by the *débris* the South Inch lade was dammed up, and the water thrown upon the Inch. The cause of the fall was owing, it is said, to the water in the lade having undermined the foundation of the wall.——At Glasgow, on Friday before last, a chimney stalk, 80 feet in height, at Townhead, fell to the ground, in consequence, as is believed, of some operations at its base having undermined the foundation.——About 48 feet of the Holywell Tunnel, on the Wilts, Somerset, and Weymouth Railway, went down on the 4th instant. The other part of the tunnel stands good. The cause of the accident was the undermining of a pond, the water weakening the work. The damage is estimated at 1,000*l.* which will have to be borne by the contractor.

STRIKES.—In consequence of a depression of certain branches of trade in the northern towns, the masters have been reducing wages, more especially builders and joiners. In November last, the North and South Shields master masons and joiners gave notice of a reduction of wages from 30s. to 24s. during winter. The men refused such terms, struck work, and, except a few engaged fitting up iron steam-ships, have remained idle ever since. The master painters of Sunderland having given notice of a reduction of wages from 27s. to 24s. the men have refused to accede. We learn that the masons, plasterers, and bricklayers of Hartlepool have resolved to strike for an advance from 24s to 27s. a week. The puddlers at large iron works at Middlesborough, turned out on notice of reduction; but after striking a fortnight, have returned to work. The fortnight they were out, they lost, it is said, 6,000*l.*; and though several had been earning 10s. to 20s. a day for a considerable time, they were quite unprepared for a prolonged strike, as in the second week they were soliciting aid from fellow-workmen.

THE ROYAL ACADEMY.—Mr. E. M. Ward has been elected an Academician: a better choice could not have been made.——Professor Hart's Lectures on Painting are being published *in extenso* in the *Athenæum*, and well deserve study.

THE PUBLIC LIBRARIES AND MUSEUMS' BILL.—This Bill, as amended in the committee of the whole House, has been printed. As it now stands, the overseers of the poor are to call public meetings to determine on the adoption of the Act, ten days' notice to be given. The list of articles for the libraries now includes books, newspapers, maps, and specimens of art and science.

THE LATE MR. GEORGE PAPWORTH.—We regret to have to announce the death on the 14th (Wednesday), of Mr. George Papworth, of Dublin, architect, Member and Treasurer of the Royal Hibernian Academy, aged about 75. We shall shortly illustrate one of his most recent works.

TENDERS FOR HOUSES AT HOLLOWAY.—The tenders for four fourth-rate houses at Holloway, for the Equitable Building Society, ranged from 973*l.* (Baker), to 769*l.* (Charles Warr), which latter was accepted.

ST. MARYLEBONE.—In a map published in 1742, the diminutive church of St. Marylebone is shown detached from London, with two zig-zag ways leading to it, one near Vere-street, then the western extremity of the new buildings, and the second from Tottenham-court-road. Rows of houses, with their backs to the fields, extended from St. Giles's-pound to Oxford-market; but Tottenham-court-road had one cluster on the west side, and the spring-water house. The zig-zag way above mentioned, near Vere-street, still retaining its original name of Marylebone-lane, was the communication between the high road and the village. A friend, born in 1780, remembers his father and mother relating how they walked out *through the fields* to be married at Marylebone Church.—*Timbs's Curiosities of London.*

COLOURING.—He who first developed the harmony of colours, out of the systole and diastole to which the retina is formed, this synkrisis and diakrisis, as Plato would call it, was the discoverer of the principles of colouring.—*Goethe.*

TO PREVENT PASTE FROM GETTING MOULDY.—A correspondent, "W. L." asks us for a recipe as to this matter, which he reminds us appeared in the *Builder*. We have no time to search for it; but would be glad to have a recipe anew from some one who can give it. If we mistake not, alum and finely pounded resin are used, as also some spirit or essence.

"NATURE-PRINTING."—Mr. Smith, of Auchterarder, a chemist, is said to have discovered a means of transferring the impressions of natural objects to glass with minute accuracy.

SURVEYOR FOR WEST HARTLEPOOL.—Mr. Smith, of Bingley, has been appointed surveyor and inspector of nuisances for West Hartlepool, at a salary of 120*l.*

WHAT ARE THE BUILDERS AT?—The following tenders have been delivered for finishing four houses, situate in the Drive, St. German's-park estate, Forest-hill. Mr. William Purdue, architect:—

Dove and Co.	£1,025	0	0
Colls and Co.	989	0	0
Thomas Nash	945	0	0
Richard Case	777	0	0
W. H. Unwin	737	0	0
J. Bishop	688	0	0
W. T. Thorpe (accepted)	618	0	0
H. Hughes	328	13	2

Z. Z.

TENDERS

For offices in Turnwheel-lane, Cannon-street. Mr. R. W. Wright, architect. Quantities supplied:—

		Allowance for Old Materials.
Lawrence and Sons	£5,200	—
Piper	5,100	—
Fox	5,100	£400
I'Anson (accepted)	4,768	200

For building two of a group of schools, with master's house, for the district of St. John's, Deptford. Mr. Peacock, architect:—

Myers	£2,965	0	0
Colls and Co.	2,750	0	0
Rudkin	2,660	0	0
Searle	2,541	0	0
Todd	2,443	0	0
Wilson	2,399	0	0
Higgs	2,388	0	0
Piper	2,364	0	0
Constable	2,300	0	0
Wells	2,295	0	0
Thompson	2,230	0	0

For building a sea-wall and forming an esplanade and approaches; for the commissioners of the town of Ryde. Mr. Francis Newman, town surveyor:—

Lee and Lavers, London	£5,937	0	0!
Diggle, Gosport	4,000	0	0
Bushby, Littlehampton	3,910	0	0
Croft, Southampton	3,735	10	0
Bennett and Holdsworth, London	3,565	0	0
Kingswell and Booker, Godshill, Isle of Wight	2,986	0	0
Dashwood, T. and J. Ryde	2,589	0	0
Harbour, Ryde	2,531	0	0
Meader, Ryde	2,350	0	0
Cutler, Ryde	2,190	0	0
Langdon, Ryde (accepted)	1,188	0	0!

TO CORRESPONDENTS.

"T. E." (in most of the principal London establishments the men both out and in-doors leave off at four o'clock on Saturdays, and are paid as if they had worked the ten hours).—"W. P."—"Dr. G."—"J. E." (comment does not seem necessary).—"S. R. R."—"J. E."—"C. F. D." (we shall notice the factory).—"T. W."—"G. S."—"J. B."—"W. S."—"R. M. S."—"Subscriber."—"C. S."—"A Poor Man."—"J. B. P."—"J. D. P."—"J. B. B."—"Mr. W."—"C. M. I." (Daly's *Revue Generale de l'Architecture*).—"Inaccuracies."—"F. and P."—"M. A. A." (shall appear).—"W. P." (should obtain prospectus of the shutters in question and judge for himself).—"Dr. C."—"A Reader" (house shall be looked to).—"B. M. M."—"Judex."—"W. O. Jun."—"Mr. H."—"F. N."—"F. M. N." "Anti-Observer."—"P. and N."—"J. M."—"P. and H." (thanks).—"An Architect."

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.

NOTICE.—All communications respecting *advertisements* should be addressed to the "Publisher," and not to the "Editor:" all other communications should be addressed to the EDITOR, and not to the Publisher.